GRTS – Generalized Random Tesselation Stratified Design

Proof: If, for some $n > 0$, s and $s + d$ are in the same subquadrant Q^n_{jk}, then $f(s)$ and $f(s + d)$ are in the same interval J^n_m, so that $|f(s) - f(s+\delta)| \leq \frac{1}{4^n}$. The probability that s and $s + d$ are in the same subquadrant is the same as the probability of the origin and $d = (d_x, d_y)$ being in the same cell of a randomly located grid with cells congruent to Q^n_{jk}. For $\delta_x, \delta_y \leq \frac{1}{2^n}$, that probability is equal to $\frac{|Q^n(0) \cap Q^n(\delta)|}{|Q^n(0)|} = 1 - 2^n(\delta_x + \delta_y) + 4^n \delta_x \delta_y$ where $Q^n(x)$ denotes a polygon congruent to Q^n_{jk} centered on x. For $D(s, \delta) = |f(s) - f(s+\delta)|$, then, we have that $P\left(D \leq \frac{1}{4^n}\right) \geq 1 - 2^n(\delta_x + \delta_y) + 4^n \delta_x \delta_y$. Thus, the distribution function F_D of D is bounded below by

$$F_D(u) \geq \begin{cases} 0, u \leq \frac{1}{4^n} \\ 1 - 2^n(\delta_x + \delta_y) + 4^n \delta_x \delta_y, u > \frac{1}{4^n} \end{cases}.$$

Because D

Everyone - if you are like me and couldn't wait to read about GRTS after our call yesterday… I would really enjoy speaking to any of you that find a successful I&M-related application of this technique. Perhaps the key to gaining wide acceptance of a statistical technique is to: 1) have Steve Fancy like it, and 2) name it after a hearty traditional meal...
Cheers, Shawn